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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In Re Application of:	)	Group Art Unit: 3661
	)	
RING, Michael E.	)	Examiner: Broadhead, Brian
	)	
Serial No.: 09/399,412	)	Attorney Docket: CRD 02384
	)	
Filed: 09/20/1999	)	Date: November 17, 2003

For: A Method and Apparatus And An Apparatus For Enhancing The Braking Efficiency Of A Railway Freight Train Consist

Commissioner of Patents and Trademarks
Alexandria, VA 22313

SUBMISSION OF APPEAL BRIEF

Sir:

On September 17, 2003, the undersigned agent for applicant filed a Notice of Appeal from the Examiner's final rejection of claims 1-3 and 5-20 dated June 17, 2003. It is applicant's intention to contest the final rejection of such claims.

Enclosed, herewith, is an Appeal Brief (in triplicate) as required by 37 CFR 1.192 and check no. 5120 In the amount of $330.00 to cover the fee for filing a brief in support of an appeal.

Respectfully submitted,

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COMMISSIONER OF PATENTS AND TRADEMARKS
Alexandria, Va. 22313

APPEAL BRIEF

Sir:

The following appeal brief for Appellant under Rule 1.192 is submitted pursuant to the Notice of Appeal and Request For Oral Hearing filed September 17, 2003 in the above-identified application.

(1) Real Party in Interest

The real party in interest of the present application is Westinghouse Airbrake Technologies Corporation.

(2) Related Appeals and Interferences

There are no appeals or interferences pending which directly affect this application.

(3) Status of Claims

Claims 1-3 and 5-20 are currently pending in the application. Claims 1-3 and 5-20 are finally rejected as per the Office Action dated June 17, 2003. An After Final Amendment dated July 2, 2001 was submitted which requested that the subject matter of claim 4 be incorporated into the independent claim 1 and claim 4 be canceled from the application. The Examiner refused entry of this amendment stating that it failed to place the application in better form for appeal by materially reducing or simplifying issues for appeal. Consequently, a continuation application was filed on August 8, 2001 in which it was requested that claim 4 be canceled and the subject matter thereof be incorporated into independent claim 1. A minor amendment was also made to claim 17.

(4) Status of Amendments

A Continuation Prosecution Application was filed September 17, 2002. The application was finally rejected as per the Office Action dated June 17, 2003. No amendments have been submitted in response to this Final Office Action.

(5) Summary of Invention

A. Background

Due to both the increased length of freight train consists that are presently being used and the ability of these freight

trains to haul substantially heavier loads it, has become important for such trains to possess the capability of stopping in as short a distance as possible. To this end, as is also quite well known in the railroad industry, today's modern freight train will normally be equipped with an electro-pneumatic type braking system in order to significantly decrease the stopping distance required and to improve the overall braking efficiency of such train.

The above-mentioned and recently developed electro-pneumatic braking systems for such railway freight cars are designed to make better use of the increased speed that a brake control signal can be transmitted throughout the length of the train consist. As is known in the art, such brake control signal can be transmitted either electrically, over a trainline, or as a radio frequency (RF) type control signal.

In either case, however, these brake control signals are transmitted to at least one electro-pneumatic type valve that is disposed on each freight car in a train consist in order to rapidly exhaust air from the brake pipe and, therefore, begin either a full service or an emergency brake application more quickly throughout the length of the train consist through the application of the requisite air pressure to the brake cylinders disposed on each car throughout the train consist.

B. Instant Invention

The present invention provides a method and an apparatus for significantly enhancing the brake performance of a brake system disposed on a freight train. Such method includes the steps of preprogramming preselected information into a computer disposed on a freight locomotive, determining a speed of such freight train consist and communicating a signal that is indicative of such speed determined to such computer. The method further includes the step of determining in such computer a pressure that can be applied to brake cylinders which will maintain substantially maximum adhesion between wheels being braked and rail surfaces in contact with such wheels and communicating a signal representative of such pressure determined to a pressure control valve in fluid communication with such brake cylinders. Thereafter maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while simultaneously substantially preventing wheel slide.

(6) Issues

The issues pending in the present application are as follows:

1-Whether Appellant's claims 1-3, 5-8, 11 and 16-17 are obvious and unpatentable under 35 USC 103(a) over Cook et al (5,605,387) in view of Fourie (4,671,576).

2-Whether Appellant's claims 9-10 and 12-15 are obvious and unpatentable under 35 USC 103(a) as being obvious over Cook et al in view of Fourie (4,671,576) and Kull (5,681,015).

3-Whether Appellant's claim 18 is obvious and unpatentable under 35 USC 103(a) as being unobvious over Cook et al in view of Fourie (4,671,576) and Matsuoka (5,544,057).

4-Whether Appellant's claims 19-20 are obvious and unpatentable under 35 USC 103(a) as being unobvious over Cook et al in view of Fourie (4,671,576) and Roselli et al (5,718,487).

(7) Grouping of Claims

The claims as presented for consideration in this appeal should not stand or fall together.

(8) Argument

A. The Prior Art

The above-noted prior art relied on by the Examiner can be summarized as follows.

Cook et al is directed to a brake energy balancing system for balancing brake torque of braking wheels of high-speed, multi-car vehicles such as MAG-LEV trains.

Fourie is concerned with the use of pre-selected information including velocity dependence of wheel to rail adhesion in controlling the deceleration of a train by appropriately blending

pneumatic braking pressure along with electrical control of the braking system.

Kull is relied upon as teaching the use of a radio-based, Electro-Pneumatic rail car braking system which supports both End-of-Train and Distributed Power Control communication systems.

Matsuoka is concerned with a load-setting device for determining the weight of the railway cars.

Roselli et al is relied upon as teaching the use of a keyboard as an input means on the locomotive.

B. Rejection

Currently, claims 1-3, 5-8, 11 and 16-17 are rejected under 35 USC 103(a) over Cook et al (5,605,387) in view of Fourie (4,671,576).

It is the Examiner's position that Cook et al discloses a brake energy balancing system for a train which includes preprogramming information into a computer and using this information to brake the train. Please note that Cook et al is directed to a magnetic levitation train. The Examiner acknowledges that Cook et al fails to teach that the pre-selected information includes velocity dependence of wheel to rail adhesion. The Examiner then relies upon Fourie as teaching the use of pre-selected information including velocity dependence of wheel to rail adhesion. The Examiner then states that it would have been obvious to use the adhesion information of Fourie in the invention of Cook

et al because knowing the adhesion characteristics help to calculate a limit of the brake demand signal to prevent unwanted slip.

Claims 9-10 and 12-15 are rejected under 35 USC 103(a) as being obvious over Cook et al in view of Fourie (4,671,576) and Kull (5,681,015). Kull is relied upon to teach the use of wires and radio as a means for communication along a train and that it would have been obvious to use wires and radio as a communication means in the brake-energy balancing system taught by Cook et al.

Claim 18 is rejected under 35 USC 103(a) as being unobvious over Cook et al in view of Fourie (4,671,576) and Matsuoka (5,544,057). Matsuoka is relied upon as teaching a load-setting device for determining the weight of railway cars and that it would have been obvious to utilize a load-setting device in the brake-energy balancing system taught by Cook et al.

Claims 19-20 are rejected under 35 USC 103(a) as being unobvious over Cook et al in view of Fourie (4,671,576) and Roselli et al (5,718,487). Roselli is relied upon as teaching the use of a keyboard as an input means on the locomotive and that it would have been obvious to utilize a keyboard in the brake-energy balancing system taught by Cook et al.

C. Appellant's Arguments

Appellant disagrees with the Examiner's position for the following reasons.

Claims 1 and 11 have been amended to include the limitation that the application of pressure to the brake cylinders is controlled so as to substantially evenly distribute braking energy to all of the vehicle wheels while preventing wheel slide and minimizing the variation in wheel temperatures. During braking of a railway vehicle, it is important to have even brake shoe forces in order to dissipate the large amounts of energy which occur during braking of the vehicle. By evenly distributing the energy to all of the wheels, the chances of damaging any one wheel or wheel set is minimized. This helps not to slide any one axle set and shares the necessary retardation forces to minimize variation in wheel temperatures. This becomes a critical point when attempting to improve stopping performance through the application of higher mechanical shoe forces.

The mechanical design modifications according to the present invention offers great performance benefits when integrated into ECP brake systems. Stop distances of entire trains can be reduced by virtually simultaneous application of the brake throughout the train. Slack and in train forces can be regulated by controlling brake applications in different portions of the train.

As stated in the previous responses, none of the art of record is concerned with the wheel to rail adhesion or the dissipation of the braking energy to avoid damaging of the railway vehicle wheels as specifically recited in the claims.

Furthermore, as stated in previous Amendments, both claims 1 and 11 are specifically directed to a method and apparatus for achieving a minimum stopping distance of a ***freight train consist***. The claims also specifically require that the ***rail to wheel adhesion*** is a significant factor in achieving this minimum stopping distance and that significant detrimental wheel slide should be avoided. The claims also specifically state that the velocity dependence of wheel to rail adhesion must be considered when determining the maximum pressure to be applied to the brake cylinders to stop the train consist.

In the Office Actions, the Examiner relies upon the teachings of Cook et al as the primary reference in showing a method and apparatus for achieving a minimum stopping distance of a "freight" train consist without incurring any significant detrimental wheel slide. The Appellant disagrees with this rejection as Cook et al is directed to a brake energy balancing system for magnetic levitation trains-see col. 1, lines 26+ and col. 2, lines 17-19. Cook et al fails to state or even suggest that the brake energy balancing system disclosed therein could be converted for use with a freight train consist. Cook et al. includes no reference whatsoever to a freight train consist nor to the use of rails upon which the train runs upon or "brakes" upon. Also, please note that portions of the Examiner's Office Action when discussing Cook et al make reference to the movement of the wheels against a rail

surface. See for example in paragraph 2 where the Examiner states "determining in the computer a pressure that can be applied to the brake cylinders that will maintain maximum adhesion between the wheels and the rail surface". This statement is misleading as Cook makes no reference to a relation between the wheels and a rail surface because MAG-LEV trains do not run along rails. It is Applicant's position that the present invention is not suggested nor rendered obvious by the teachings of Cook et al.

Claim 1 specifically recites in subparagraphs (a) and (c) that a computer is disposed on a freight locomotive. Subparagraph (d) of claim 1 requires maximum adhesion between wheels being braked and rail surfaces in contact with the wheels. Claim 11 includes similar limitations to a freight train locomotive and/or freight car in subparagraphs (a), (b), and (c). These limitations recited in the claims are clearly not taught or suggested by Cook et al.

Furthermore, since the MAG-LEV train of Cook et al. does not run along a rail as does the present invention, Cook et al makes no reference to the use of velocity dependence of wheel to rail adhesion when determining the maximum amount of pressure to be applied to the brake cylinders to achieve stopping of the train while preventing wheel slide with respect to the rails. This is a significant element when determining the maximum amount of pressure to be applied to the brake cylinders. The present application discusses the importance of this element throughout the

specification-see pages 11, 16-17 and charts 1-7. Also, Cook et al are not concerned with the dissipation of the braking energy through the even application of braking pressure to the cylinders so as to minimize the variation in temperatures of the wheels and to prevent damage to the wheels and/or wheel sets caused by sliding of one or more wheels with respect to the rail.

The Board's attention is also directed to page 16, lines 10-17 of the specification which discuss the need to minimize variation in wheel temperatures and the need to avoid sliding any one wheel or wheel set along the rails. None of these above discussed factors are considered in Cook et al. because the MAG-LEV train of Cook et al. does not run or brake along a rail.

The Examiner relies upon the teachings of Fourie as teaching the use of pre-selected information including velocity dependence of wheel to rail adhesion in controlling the deceleration of the train by appropriately blending pneumatic braking pressure along with electrical control of the braking system. The Examiner states that it would have been obvious to one having ordinary skill in the art at the time of the invention to use the adhesion information of Fourie in the invention of Cook et al because knowing the adhesion characteristics help to calculate a limit to the brake demand signal to prevent unwanted slip. It is the Applicant's position that the combination of Fourie in the Cook et al invention is flawed as one having ordinary skill in the art would not use wheel

to rail adhesion characteristics in the Cook et al system as a MAG-LEV train does not run along a rail. Thus, such information would be useless in determining the maximum amount of pressure to be applied to the brake cylinders to stop the train consist in a shortest possible distance while preventing wheel slide along the rail.

In the "Response to Arguments" section of previous Office Actions, the Examiner states that "The variables for such things as wheel adhesion would be different between a road and rail, but the systems would still operate the same". The Appellant disagrees. The MAG-LEV train of Cook et al. does not brake while the train is running along a rail, but rather is similar to an airplane touching down on a runway, i.e. a planar surface. The Board's attention is directed to col. 4, lines 30+ of the reference which discuss the use of a signal indicating whether or not a wheel is locked during touchdown of the wheels and providing a hydroplaning detection signal to guard against hydroplaning of a wheel on touchdown at high speeds. Thus, it is not seen by Appellant how the teachings of Cook et al. can be concerned with the rail to wheel adhesion and minimizing wheel slide during braking as required by the claims when the train does not run along, nor is it braked while running along a rail.

In the Office Action dated December 20, 2002 the Examiner states that Cook et al discloses using his invention on other types

of trains or the like. The Examiner concludes from this statement that such would include freight trains. The Appellant disagrees as MAG-LEV trains and railway trains have numerous differences and operate in entirely different manners as pointed out above. As discussed in detail above, the forces which act upon the wheels in MAG-LEV vehicles and those which act upon railway vehicles are vary greatly. Additionally, the braking systems of MAG-LEV trains are very different than the braking systems of railway trains. Considering the number of variables involved, one having ordinary skill in the art would not look to the teachings of Cook et al to determine a braking system for a railway freight vehicle.

In this regard, it is axiomatic that "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion, incentive supporting the combination." *In Re Bond,* 910 F.2d 831, 15 USPQ 2d 1566, 1568 (Fed. Cir. 1990); *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 134, 140, 231 USPQ 644, 647, (Fed. Cir. 1986).

As to claims 3, 5 and 6, Cook et al is not concerned with preventing wheel slide as it is directed to a MAG-LEV train. As to claim 3, Cook et al fails to consider the length of the train and programming this information into the computer to aid in applying brake pressure to the brake cylinders.

As to claims 7-8 and 16-17, Cook et al is concerned with a MAG-LEV train and thus does not have a locomotive or freight cars

upon which signals may be communicated to or the computer can be located.

In view of the above considerations, it is respectfully requested that the Board of Appeals overturn the final rejection of claims 1-3, 5-8, 11 and 16-17 under 35 USC 103 as being obvious over Cook et al in view of Fourie.

With respect to dependent claims 9-10, 12-15 and 18-20, since the combination of Cook et al with Fourie is improper, then it is Appellant's position that the limitations set forth in these claims are not met. The references to Kull, Matsuoka and Roselli et al fail to overcome the deficiencies of the combination of Cook et al with Fourie. Accordingly, it is also respectfully requested that the Board of Appeals overturn the final rejections of claims 9-10, 12-15, and 18-20.

D. Conclusion

In view of the above considerations, and regarding the rejection of claims 1-3 and 5-20, it is respectfully submitted that the Examiner erred in finally rejecting these claims under 35 USC 103(a) as being unpatentable over the combination of references set forth above. Appellant respectfully requests that the final rejection be repealed and the claims be allowed.

Respectfully submitted,
JAMES RAY & ASSOCIATES

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(9) Appendix

1. A method of substantially achieving a minimum stopping distance of a freight train consist without incurring any significant detrimental wheel slide, said method comprising the steps of:

(a) preprogramming preselected information into a computer disposed on a freight locomotive including velocity dependence of wheel to rail adhesion;

(b) determining a speed of such freight train consist;

(c) communicating a signal that is indicative of said speed determined in step (b) to such computer disposed on such freight locomotive;

(d) determining in such computer a pressure that can be applied to brake cylinders which will maintain substantially maximum adhesion between wheels being braked and rail surfaces in contact with such wheels such that braking energy is substantially evenly distributed to all of such wheels;

(e) communicating a signal representative of such pressure determined in step (d) to a pressure control valve in fluid communication with such brake cylinders; and

(f) using said velocity dependence of wheel to rail adhesion in maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while

simultaneously substantially preventing wheel slide along said rails, minimizing variation in wheel temperatures, and substantially evenly distributing braking energy to all of such wheels.

2. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein said method includes an additional step of providing preselected feedback information to such computer.

3. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein said preselected information programmed into such computer disposed on a freight locomotive, in step (a), includes a length of such train consist and said method includes an additional step of using said length in maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while simultaneously substantially preventing wheel slide.

5. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein said preselected information programmed into such computer disposed on a freight locomotive, in step (a), includes a weight of at least such train consist and said method includes an additional step of

using said weight in maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while simultaneously substantially preventing wheel slide.

6. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 5, wherein said preselected information programmed into such computer disposed on a freight locomotive, in step (a), includes a weight of each car disposed in such train consist and said method includes an additional step of using said weight of said each car in maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while simultaneously substantially preventing wheel slide.

7. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein said signal that is indicative of said speed determined in step (b) is an electrical signal communicated to such computer disposed on such freight locomotive.

8. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein said signal representative of such pressure determined in step (d)

is an electrical signal communicated to such pressure control valve disposed in fluid communication with such brake cylinders.

9. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 1, wherein at least one of said signals communicated in steps (c and e) is communicated as a radio signal.

10. A method of substantially achieving a minimum stopping distance of a freight train consist, according to claim 9, wherein each of said signals communicated in steps (c and e) is communicated as a radio signal.

11. An apparatus for substantially achieving a minimum stopping distance of a freight train consist without incurring any significant detrimental wheel slide, said apparatus comprising:

(a) a program having preselected information including velocity dependence of wheel to rail adhesion disposed in a computer disposed on a freight locomotive;

(b) a speed sensing means disposed on at least one of such locomotive and a freight car for determining a speed of such freight train consist;

(c) a means connected to said speed sensing means for communicating a signal that is indicative of said speed to such

computer disposed on such freight locomotive, so that such program can determine a pressure that can be applied to brake cylinders which will maintain substantially maximum adhesion between wheels being braked and rail surfaces in contact with such wheels and substantially evenly distributing braking energy to all of such wheels; and

(d) a means connected to such computer for communicating a signal representative of such pressure determined by said program to a pressure control valve disposed in fluid communication with such brake cylinders and maintaining a maximum pressure on such brake cylinders that will stop such train consist in a shortest possible distance while simultaneously substantially preventing wheel slide along said rails, minimizing variation in wheel temperatures, and substantially evenly distributing braking energy to all of such wheels.

12. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said means connected to said speed sensing means for communicating said signal that is indicative of said speed to such computer is a wire.

13. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11,

wherein said means connected to such computer for communicating a signal representative of such pressure determined by said program to said pressure control valve is a wire.

14. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said means connected to said speed sensing means for communicating said signal that is indicative of said speed to such computer is a radio transmitter.

15. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said means connected to such computer for communicating a signal representative of such pressure determined by said program to said pressure control valve is a radio transmitter.

16. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said speed sensing means is disposed on said locomotive.

17. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said speed sensing means is disposed on at least one freight car.

18. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said apparatus further includes a means disposed on such train consist for determining a weight of such train consist.

19. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said apparatus further includes a means disposed on such train consist for inputting information into such computer disposed on such locomotive.

20. An apparatus for substantially achieving a minimum stopping distance of a train consist, according to claim 11, wherein said means disposed on such train consist for inputting information into such computer is a keyboard.